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ABSTRACT

The study examined the effect of test modifications on the performance of 10 handicapped preschoolers on the Stanford-Binet Intelligence Scale (Form L-M). Adaptations of both stimulus and response modes were designed and constructed for subtests at the preschool levels on the Stanford-Binet. Attempts were made to maintain the functional equivalence of the cognitive concept involved in each task without altering the primary content of the item. Ss who failed the subtests under standardized conditions were administered adapted subtests. Results revealed a significant, positive correlation between the severity of the child's handicap and the improvement of his/her performance on the adapted test items. The greater the degree of the child's sensory and/or motor handicap, the more improved was the child's performance on the adapted test items. (Author/CL)

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HANDICAPPED CHILDREN'S PERFORMANCE ON STANDARD AND ADAPTIVE ITEMS OF THE STANFORD-BINET INTELLIGENCE SCALE (FORM L-M)

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This paper represents the opnions of the authors and not necessarily that of Meyer Children's Rehabilitation Institute or the University of Nebraska Medical Center.

Handicapped Children's Performance On Standard
And Adaptive Items Of
The Standford-Binet Intelligence Scale (Form L-M)

Abstract

The purpose of the study was to examine the effect of test modifications on the performance of handicapped preschool children (chronological age ranging from 3 years, 4 months to 5 years, 7 months) on the Stanford-Binet Intelligence Scale (Form L-M). Adaptations of both stimulus and response modes were designed and constructed for subtests at the preschool levels on the Stanford-Binet. Attempts were made to maintain the functional equivalence of the cognitive concept involved in each task without altering the primary content of the item. Ten subjects were rated on a scale of handicapping conditions and assessed on the Stanford-Binet under standardized conditions. Subjects who failed the subtests under standardized conditions were then administered adapted subtests. There was a significant, positive correlation between the severity of the child's handicap and the improvement of his/her performance on the adapted test items. The greater the degree of the child's sensory and/or motor handicap, the more improved was the child's performance on the adapted test items. Implications of these findings are discussed in relation to nondiscriminatory assessment procedures and to the development of assessment models for instructional intervention with severely handicapped children.

Handicapped Children's Performance on Standard
And Adapted Items Of
The Stanford-Binet Intelligence Scale (Form L-M)

The identification and classification of multiply handicapped children presents difficulty for professionals engaged in assessment of cognitive development. Currently there is an increasing concern regarding both the appropriateness of the procedures used in the process and the relevance of test findings to educational planning. Federal legislation mandates that tests and other evaluative procedures be nondiscriminatory in nature. However, bias in assessment and placement occurs whenever decisions regarding a child's cognitive level are inappropriately affected, by race, culture, economic status or disability. The requirement that tests be validated for the purposes for which they are used was identified as a major issue facing psychologists at the Spring Hill Symposium on the Future of Psychology in the Schools (Ysseldyke, 1982).

A number of alternatives have been proposed to address the issue of valid and reliable assessment of handicapped children. These alternatives reported by Kaufman (1979) range from the suggested use of criterion referenced measures (which is in direct opposition to state and federal requirements for diagnosis and certification of handicapped children) to a possible call for a moratorium on all intelligence testing. Despite the obvious problems associated with the use of standardized norms when standard procedures are not followed in test administration, adaptations have been discussed by many professionals (Sattler, 1982). Because of the lack of systematic study of test adaptations, the reliability as well as validity of test findings is sometimes problematic.

Identification of children as handicapped may be affected by the special characteristics of the child and the characteristics of the measuring

instrument. If standardized tests are to continue to be used for special populations, systematic study of these variables is needed to resolve the dilemma facing the evaluator.

The problem of accurate assessment has proven to be especially acute in assessing the young handicapped child since assessment instruments designed for particular populations generally focus on school-age populations. In reviewing major problems associated with the assessment of young severely handicapped children, Simeonsson, Huntington, and Parse (1980) note that the deformities, defects, and disabilities of these children may restrict performance and/or mask their true abilities. The authors also comment on the lack of appropriate instruments for children with more than one impairment.

A study by Krenzer (1980) examined the issue of whether adapted items can be developed that are psychometrically equivalent to standard items. This was done by administering both the standard and the adapted versions to a non-handicapped population consisting of 70 non-handicapped preschoolers. In Krenzer's study it was hypothesized that no significant difference would be found between the subject's performance on the standardized items and the adapted items. Student t-tests were performed for each pair of items (score on standard item and score on adapted item) in order to determine whether the adapted items were of equivalent difficulty. Seventy non-handicapped subjects were administered each of the item pairs at a one week interval with the order of presentation, standard versus adapted, counter balanced. Of the 41 pairs of items, five were discarded because the subjects demonstrated significantly better performance on the adapted items ($p. < .05$). No significant differences were demonstrated between scores on the standard and adapted items for the remaining 36 items studied. Those 36 items were used in this study.

The study reported here was concerned with the systematic modification of subtests of the Stanford-Binet Intelligence Scale (Form L-M) at the preschool level. The relationship between the severity of handicapping conditions and the benefit of test adaptations was explored. It was predicted that the more severe the degree of the child's motor, sensory and/or speech handicaps, the greater would be the improvement of the child on adapted test items.

METHOD

Subjects: The participants in this study were 10 preschool children ranging in age from 3 years, 4 months to 5 years, 7 months (5 male, 5 female). The group demonstrated cognitive functioning extending from the moderately delayed to the average range and also exhibited various degrees of physical, sensory and/or speech impairments which might interfere with the intake of or response to test stimuli. These impairments included various degrees of deficits in fine motor, gross motor, vision, hearing and/or speech. Many of the children had been previously evaluated with traditional standardized assessment instruments. Several of the subjects were enrolled in a therapeutic preschool program associated with a children's rehabilitation institute. The remainder of the subjects had also been evaluated at the same facility and were enrolled in preschool programs in the area.

Materials: Prior to data gathering, adaptations were devised for preschool subtests on the Stanford-Binet Intelligence Scale (Form L-M) following principles for adaptations recommended by Haussermann (1958). Adaptations were designed for 41 of the 49 subtests at the preschool levels (level II through level V). The 36 adapted items demonstrating no significant differences from standard items (Krenzer, 1980) were utilized in results of this study. These adaptations consisted of the use of larger and more easily manipulable materials, the use of enlarged pictures and drawings, the use of

stimulus items separated from book format, the acceptance of alternative responses such as pointing for naming and the use of stimulus materials in altered medium. Table I includes a brief description of the stimulus adaptation for each of the preschool subtests, a description of response adaptations and the sensory-motor impairment that the adaptation attempted to circumvent. The primary intent of each adaptation was to reduce or divorce the sensory and motor components of each task while attempting to maintain the cognitive functions or processes required for correct performance.

Insert Table I here

A rating scale for use in the evaluation of each subject's sensory, motor and/or speech skills as related to "test taking" was utilized in this investigation. The rating scale was an adaptation of a similar instrument devised by Katz (1956). The Katz Scale was changed only in that the "walking" category was replaced by "sitting balance" which appeared more relevant to test responses. On the basis of medical records and observation, each subject was rated on a scale from 0 (normal) to 3 (severe) in each of the following areas: sitting balance, head control, hearing, vision, visual-motor, and speech. Intellectual ability was not included in this rating. To compute the total disability index, scores were summed. Higher scores reflected more pronounced and/or more multiple disabilities. Rating scale results provided quantitative data to be used in rank-ordering subjects in regard to their disabling conditions. Interrater agreement was examined by having a special educator not otherwise involved in this study rate the subjects on the disability scale on the basis of medical and education records. Interrater

agreement between the primary investigator ratings and the special educator was .90.

Procedures: The following procedures were implemented to examine the prediction that the more severe the motor, sensory and/or speech handicap of the subject, the greater would be his/her improvement in performance on adapted items as compared to standardized items. Each of the 10 subjects was rated on the adapted Katz Scale of handicapping conditions and was given the standard form of the Stanford-Binet Intelligence Scale (Form L-M). Failed subtests previously studied by Krenzer (Note 1) were readministered in adapted form as described in Table 1.

The two examiners who administered the Stanford-Binet Intelligence Scale (Form L-M) as well as the adaptation were certified school psychologists who have specialized in preschool assessment. Training in administration of adaptations was accomplished prior to the initiation of the study.

RESULTS

Using Spearman's rank order correlation coefficient formula, a measure of the association between the degree of handicap and the improved performance utilizing adapted items was computed. The obtained correlation coefficient of .76 was found to be significant at the $p < .01$ level. Figure 1 provides a graphic illustration of the relationship between degree of disability and the improved performance under adapted conditions. Consequently it was concluded that for this group of handicapped children, the greater the child's degree of disability, the greater was the child's improvement on adapted items from the Stanford-Binet Intelligence Scale.

Insert Figure 1 Here

A rank order correlation coefficient of .03 was obtained between the standard IQ scores and the gain scores on items administered under adapted conditions. This finding would suggest that the impact of adaptations was not associated with the level of cognitive functioning since the subjects with less severe delays in intellectual performance demonstrated significantly less improvement on the adapted items. These findings are consistent with the results of the Krenzer study (1980) and suggest that practice effect and/or reduction of the demands of the items were probably not the main factors accounting for the improvement seen in the more handicapped children.

Insert Table 2 here

DISCUSSION

Results of this study suggest that the performance of children with multiple physical and sensory handicaps may be improved by test adaptations. Assessment is an important step in the decision making process of placement and educational planning. Yet, the characteristics of multiply handicapped children often make it inappropriate to assess them with traditional standardized instruments. When the physical limitations of the child are not considered, cognitive assessment findings may be invalid. Results of this study also point out the risk of discrimination when standardized tests are administered to physically and sensory involved preschoolers. This risk is particularly high when multiply handicapped children whose delays may be secondary to neurological impairment are assessed with standardized intelligence tests. Although the more visible instances of discrimination such as separate school programs are now less prevalent, many professionals are unaware of the bias which may result from the reliance on results from

standardized tests. Biased test results may, in turn, lead to inappropriate placement and programming.

The use of innovative and adapted testing procedures provides valuable information for the design, implementation and evaluation of individual educational programs. When alternatives are explored during assessment, this information can be directly translated into classroom strategies. Of special interest during this study was the serendipitious observation that parents who observed the adapted test administration spontaneously suggested additional adaptations and became actively involved in modifying teaching materials in their homes. It appears likely that more rigorous study of alternative methods of testing which includes evaluation of the appropriateness of adaptation procedures such as used in the Krenzer study (Note 1) might lead to improved understanding of the handicapped child's spectrum of abilities and also provide more reliable measures of the child's progress.

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Table 1

Sensory-Motor Adaptations of the Preschool Levels of the Stanford-Binet Intelligence Scale (Form L-M)

Item		Code	Name of Test	Adaption[a]	Impairment
II	1.	A	Three-Hole Form Board	larger shapes & board (bevelled edges)	motor-visual
	2.	A	Delayed Response	larger kitty & boxes	motor-visual
	3.	A	Identifying Parts of the Body	use doll	visual
	4.	A	Block Building	larger foam cubes	motor-visual
	5.	B	Picture Vocabulary	enlarged drawings on separate cards	visual
	Alt.	D	Identifying Objects by Name	drawings of objects on separate cards	visual
II-6	1.	D	Identifying Objects by Use	drawings of objects on separate cards	visual-motor
	2.	A	Identifying Objects of the Body	See II, 3.	visual
	3.	A	Naming Objects	larger objects	visual
	4.	B	Picture vocabulary	enlarged drawings on separate cards	visual

Table 1 continued

Item	Code	Name of Test	Adaption[a]	Impairment
6.	A	Obeying Simple Commands	change directions and larger objects	visual - motor
Alt.	A	Three-Hole Form Board: Rotated	See II, 1.	motor - visual
III 1.	A	Stringing Beads	larger beads, leather string	motor
2.	B	Picture Vocabulary	See LL, 5.	visual
3.	A	Blocking Building: Bridge	See II, 4.	motor - visual
4.	A	Copying a Circle	Separate paper verbal cue - "round and round"	motor - visual
5.	A	Drawing a Vertical Line	separate paper verbal cue - "zip"	motor - visual
III-6 1	B	Comparison of Balls	enlarged drawings on separate cards	motor - visual
2.	A	Patience:Pictures	wooden pieces	visual-motor
3.	B	Discrimination of Animal Pictures	enlarged drawings on separate cards	visual - motor
4.	A	Sorting Buttons	use checkers, red and black large containers	motor - visual
5.	C	Comprehension 1	pictures/4 choice format (R) pointing response for verbal response	speech

Table 1 continued

Item	Code	Name of Test	Adaptation[a]	Impairment
Alt.	A	Comparison of Sticks	larger sticks	motor - visual
IV 1	B	Picture Vocabulary	See II, 5.	visual
2	A	Naming Objects from Memory	larger objects	visual
3.	B	Pictorial Identification	larger drawings-array of 6	visual - motor
4.	B	Discrimination of Forms	larger drawings-array of 10	visual - motor
IV-6 1.	B	Aesthetic Comparison	larger drawings on separate cards	visual - Motor
2.	B	Pictorial Similarities and Differences I	larger drawings	visual - motor
3.	C	Three Commissions	change directions to: Here is a dog, put it on the table, put the block in the box, then give me the car. (R) pointing response for verbal response	motor
4.	C	Comprehension III	pictures/4 choice format (R) pointing response for verbal response	speech
Alt.	B	Pictorial Identification	See IV, 4.	visual - motor

Table 1 continued

	Item	Code	Name of Test	Adaptation[a]	Impairment
V	1	C	Picture Completion: Man	wooden figure and parts (R) child assembles puzzle does not draw.	visual-motor
	2	A	Paper Folding: Triangle	cloth	motor
	3.	B	Pictorial Similarities and Differences II	enlarged drawings on separate cards	visual - motor
	Alt.	A	Knot	leather string	motor

[a]Stimulus adaptations unless coded (R) for response adaption.

Explanation of Codes:

A - Enlarged and/or more manipulable materials or subjects. Change in stimulus; no change in response.

B - Enlarged pictures; separate from book format. Change in stimulus: no change in response.

C - Substitute pictures or materials for verbal or graphic response. change in stimulus; change in response.

D - Enlarge and separate stimulus material. Change in stimulus; no change in response.

Table 2

Disability Rating, Standardized IQ and Adapted Gain Score

Subject Number	Disability Rating	Standard IQ	"Adapted Gain" Score
1	15	98	4
2	12	73	2
3	10	79	3
4	15	49	5
5	10	71	1
6	14	91	3
7	8	84	1
8	11	60	5
9	9	49	2
10	9	55	1

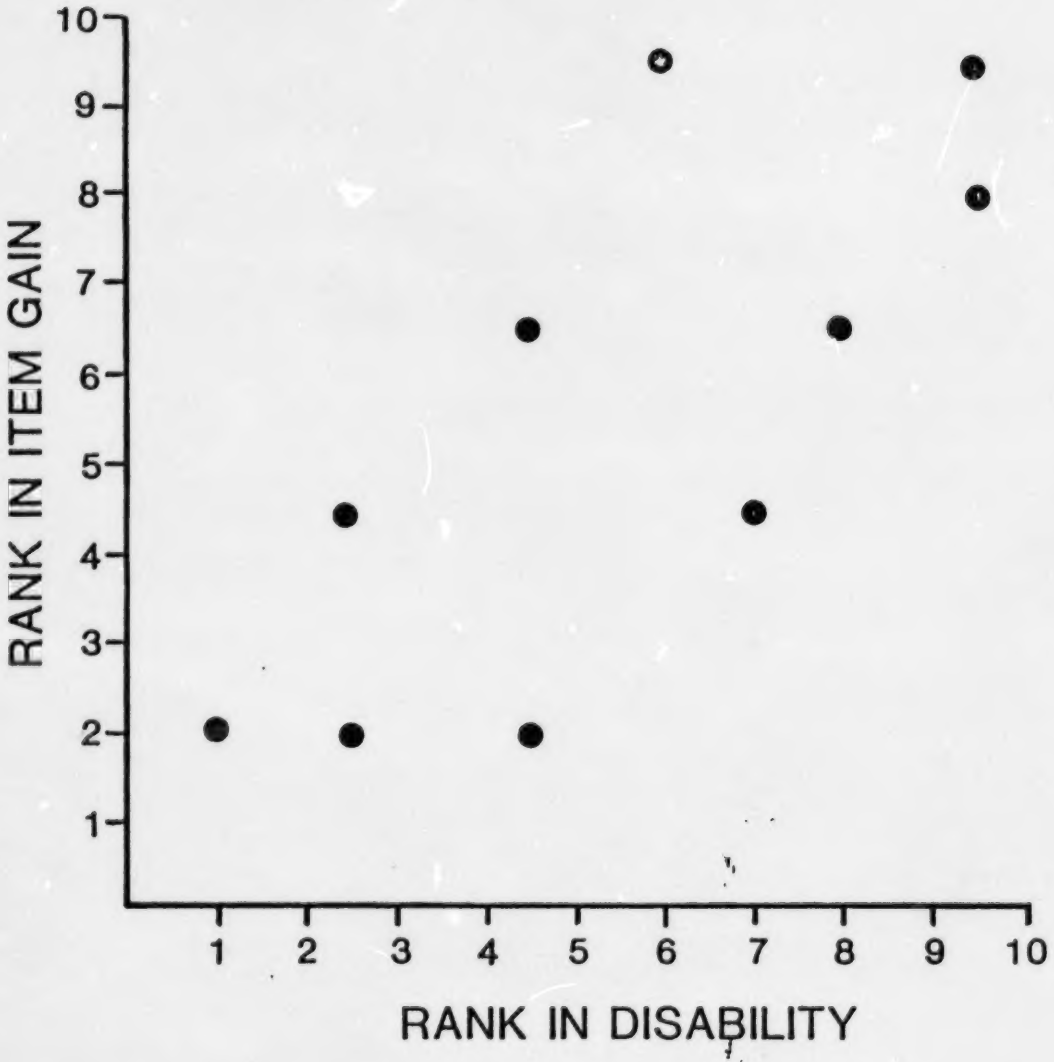

FIGURE 1. Relationship between degree of disability and rank order in number of items of improved performance